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Iceland-Faroe Ridge overflow dynamics, 55-6 ka BP

Maryam Mirzaloo[1,2], Dirk Nürnberg[2], Markus Kienast[3], and Jeroen van der Lubbe[4]
[1]HOSST Research School,GEOMAR Helmholtz Center for Ocean Research, Kiel, Germany
[2]Ocean Circulation and Climate Dynamics, GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany
[3]Department of Oceanography, Dalhousie University, Halifax, Nova Scotia, Canada
[4]Department of Geology and Geochemistry, Faculty of Science, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands

The understanding of the past changes in this critical area of oceanic circulation will be beneficial to predict future climate conditions and their related socio-economic impacts. Sediment cores recovered from the western flank of the Iceland-Faroe Ridge (IFR; P457-905 and -909) provide unique archives to reconstruct changes in the Iceland-Scotland overflow water (ISOW), an important component of the Atlantic Meridional Overturning Circulation (AMOC) over the last 55-6 ka BP. We provide high-resolution records of lithogenic grain-size and XRF bulk chemistry on millennial timescales. The age models of both cores have been constrained by radiocarbon datings of planktonic foraminifera and distinct tephra layers, which include the well-known Faroe-Marine-Ash-Zones (FMAZ) II and III. Both grain-size and XRF bulk chemistry (Zr/Rb and Ti/K) reveal prominent Dansgaard-Oeschger sedimentary cycles, which reflect considerable changes in near-bottom current strength and sediment transport/deposition. The transition between cold Greenland Stadials (GSs) and warm Greenland Interstadials (GIs) occur in typical, recurring sedimentation patterns. The GIs are characterized by relatively strong bottom currents and the transport/deposition of basaltic (Ti-rich) silts from local volcanic sources resembling the modern ocean circulation pattern. In contrast, fine grained felsic (K-rich) sediments were deposited during GSs, when the ISOW was weak. In particular, the Heinrich (like) Stadials HS1 and HS2 stand out as intervals of very fine felsic sediment deposition and hence, slackened bottom currents. The bottom currents appear to progressively strengthen throughout the GIs, and sharply decline towards the GSs. This pattern contrasts with records from north of the IFR, which might be explained by a diminishing contribution of the flow cascading over the IFR. Together, these new records show strong changes in bottom current dynamics related to the Iceland-Scotland overflow, which has a strong influence on the past and modern climate of the North Atlantic Region. However, climate change is an interdisciplinary field of research. HOSST-TOSST transatlantic interdisciplinary research program provides the unique opportunity for constructive communication and collaboration among scientists with different skills filling knowledge gaps and bridging the earth sciences with social and economic disciplines. Such interdisciplinary programs at early stages in an academic career is necessary to move and encourage the new generation of the scientific community toward a tradition of broad□scale interactions.